



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/880,518	06/12/2001	Kun-Chih Wang	JC-7265-C	5023

7590

06/09/2003

CHARLES C.H. WU & ASSOCIATES  
Suite 710  
7700 IRVINE CENTER DRIVE  
Irvine, CA 92618-3043

EXAMINER

NGUYEN, DILINH P

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/880,518

Applicant(s)

WANG, KUN-CHIH

Examiner

DiLinh Nguyen

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaha (U.S. Pat. 6,297,563) in view of Lu et al. (U.S. Pat. 6100573).

- Regarding claims 1 and 8, Yamaha discloses a semiconductor device (cover Fig., column 5, lines 60 et seq.) comprising:

a substrate 10;

a bonding pad layer 32 (column 10, line 65) above the substrate;

an area structure A between the bonding pad layer and the substrate, wherein the area A structure includes:

a plurality of conductive metallic layers 14a, 20a and 26a, wherein each conductive metallic layer is at a different height level from the substrate, and

a plurality of conductive plugs 18a, 24a and 30a for linking neighboring conductive metallic layers and the conductive metallic layers with the bonding pad layer and the substrate;

an area structure B between the bonding pad layer and the substrate, wherein the area B structure includes:

Art Unit: 2814

a plurality of conductive metallic layers 14b, 20b and 26b, wherein each conductive metallic layer is at a different height level from the substrate, and

a plurality of conductive plugs 18b and 24b for linking neighboring conductive metallic layers and the conductive metallic layers with the bonding pad layer and the substrate;

wherein the plugs 24b for linking up the area structure A and the area structure B with the bonding pad layer 32.

an insulation layers 12, 16, 22 and 28 between the bonding pad layer, the area A and B structures.

Yamaha discloses the claimed invention but does not specifically point out a current conduction structure and a mechanical support structure. However, the structure A of Yamaha is inherently the current conduction structure and the area B is a mechanical support structure for the device and it is obvious that the mechanical structure connecting with the non-device section of the substrate.

Yamaha discloses the claimed invention except for the metallic layers in both structures A and B are directly contact with the substrate for connecting the bonding pad layer and the substrate electrically.

Lu et al. disclose the first metallic layers 304 are directly contact with the substrate 300 (cover Fig., column 3, lines 25 et seq.) for connecting the bonding pad layer and the substrate electrically. Therefore, it would have been obvious to one having a ordinary skill in the art at the time the invention was made to provide the

Art Unit: 2814

structure with the substrate connected to the bonding pad which can eliminate the peel phenomenon caused by stress, as shown by Lu et al.

- Regarding claims 2-4, 6-7, 9, 11-12 and 14-15, Yamaha discloses: each conductive metallic layer in the structure A has a smaller cross-sectional area than each metallic layer in the structure B; a number of metallic layers in the structures A and B are identical and at an identical height level; and the conductive plugs between neighboring conductive metallic layers, between the bonding pad and metallic layer and between the metallic layer and the substrate of the structures A and B are evenly distributed.
- Regarding claims 5 and 13, it would have been obvious to provide the number of conductive metallic layers in the current conduction structure differs from number of support metallic layers in the mechanical support structure.
- Regarding claim 10, Yamaha discloses each conductive metallic layer in the current conduction structure and each support metallic layer in the mechanical support structure has an identical cross sectional area (cover fig.).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers

Application/Control Number: 09/880,518

Page 5

Art Unit: 2814

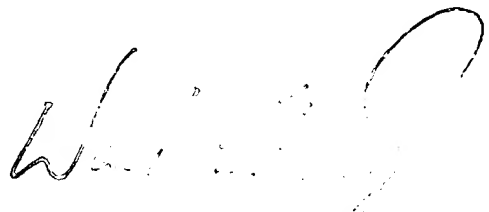
for the organization where this application or proceeding is assigned are (703) 308-7722

for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN

June 4, 2003



SUPERINTENDENT  
TECHNOLOGY CENTER 2800